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Att: The Int. Preliminary Examining Authority

12 December 2003

By fax 00 49 89 2399 4465

Dear Sirs

Int. patent application No PCT/IB03/00832
Applicant: Inter IKEA Systems B.V. et al
My ref: 77139 TN/kp

Term for reply: 14 December 2003

Referring to the Official Communication "Inviation to restrict or to pay additional fees" dated 14 November 2003 please find enclosed a new set of claims.

The new claim 1 corresponds to the old claims 1, 7 and 8 (except the last six words) in amalgamated form.

The new claim 2 corresponds to the old claim 9.

The new claim 3 corresponds to the old claims 4 and 5 and the last six words of claim 8.

The new claim 4 corresponds to the old claim 6.

The new claim 5 corresponds to the old claim 2.

The new claim 6 corresponds partly to the old claim 3.

The new claims correspond to the old claims with the pencil amendments therein, conf. the enclosed draft. By these amendments no new subject matter matter has been introduced.

The new claim 1 focuses on the feature that there is a small phase displacement φ between the waves in the two auxiliary layers 12,14. As a result the rigidity of the packing material is increased and in a very simple way.

The Examiner has cited:

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EP-A-0424526 (D1) which relates to a composite corrugated body. I agree that it anticipates the old claim 1, but not the new claim 1 as it fails to disclose something corresponding to a small phase displacement φ between the waves of the two auxiliary layers; actually EP 0424526 does not disclose two auxiliary layers, only one. Thus this publication is not anticipating any longer.

WO-A-0071277 (D2) which relates to a sheet and strip material. It seems to be only Fig. 9 which could have some relevance, but there is only disclosed one auxiliary layer (21), not two; consequently there is no reference to any phase displacement φ between the waves of two auxilary layers. Thus this publication is not anticipating any longer.

As to the inventive step (Article 33(3) PCT) of the new claim 1 I should like to refer to a declaration from professor Mads Johnsson of Lunds Tekniska Högskola (conf. enclosure A). Said declaration was filed in the corresponding Danish patent application No PA 2002 00347 wherein the claims recently have been amended in the same way as in the present application.

As you will note the inventive corrugated cardboard substantially distinguishes over the prior art.

It is respectfully requested that the Examiner now accepts the patentability of the present invention.

Yours faithfully
CHAS. HUDE A/S

Tage Nørgaard
Representative of the Applicant

Encs:

Amended claims (pages 9 and 10)
Draft
Declaration and English translation therof, Encl. A
Form 1038

Claims

1. A packaging material of the corrugated cardboard type made by gluing together plane paper layers (11, 13, 15) and auxiliary paper layers (12, 14) with waves presenting an amplitude (a) perpendicular to the plane of propagation of the auxiliary paper layer, and where the wave tops form a system of substantially parallel waves (10, 10', 10") presenting an amplitude (b) in the plane of propagation of said auxiliary paper layer (13), **characterised in**, that it includes a plane paper layer (11), an auxiliary paper layer (12) arranged below said plane paper layer, a second plane paper layer (13a) arranged below said auxiliary paper layer, and a second auxiliary paper layer (14) arranged below said second plane paper layer (13a) and optionally a third plane paper layer (15) and that as far as the waves are concerned which present an amplitude perpendicular to the direction of propagation of the two auxiliary paper layers (12, 14), a small phase displacement φ is provided between the waves of these layers.

2. A packaging material according claim 1, **characterised in**, that the waves of at least one type of waves on the auxiliary paper layers are rather flat on the sides in such a manner that the waves are of a substantially serrated (22, 23) shape, viz. triangular waves with tops and bottoms which are optionally slightly rounded, or the waves can be substantially "square" (32), viz. square waves.

3. A packaging material according to claim 1, **characterised in** , that the surface of the auxiliary paper layer (3, 13) follows a face substantially corresponding to the mathematical functional expression:

$$z(x,y) = a\sin\left(\frac{2\pi}{\lambda_1}x + \frac{\pi}{2} + b\sin\frac{2\pi}{\lambda_2}y\right)$$

where a and λ_1 represent the amplitude and the wavelength, respectively, of the waves perpendicular to the plane of propagation of the auxiliary paper layer, and where b and

λ_2 represent the amplitude and the wavelength, respectively, of the waves in the plane of said auxiliary paper layer, viz. the plane of propagation, and that the ratio $\frac{a}{b}$ of the amplitudes for the two types of waves may be in the range of 0.10 to 0.60, preferably 0.15 to 0.50, especially 0.22 corresponding to a = 0.5 mm and b = 2.25 mm, the phase displacement φ between the waves in the two auxilary paper layers fulfilling the condition, preferably of between $\frac{\pi}{4}$ and $\frac{\pi}{3}$.

4. A packaging material according to one or more of the claims 1 to 3, **characterised in**, that the ratio $\frac{\lambda_1}{\lambda_2}$ of the wavelengths for the two types of waves is in the range of 0.09 to 0.20 and preferably is approximately 0.15 corresponding to λ_1 = 3.5 mm and λ_2 = 23.5 mm.

5. A packaging material according to claim 2, **characterised in,** that the plane paper layers (11, 13, 15) and the auxiliary paper layers (3, 13) are of the same thickness, preferably between 0.05 and 0.3 mm, such as 0.1 mm, and that the auxiliary paper layers (3) is of a weight of 50 to 250 g/m^2, especially 70 to 150 g/m^2.

6. A packaging material according to claim 1 or 2, **characterised in,** that starch-based or cold-water glue is used for the lamination of the layers.

Encl. A

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Utlåtande

Undertecknande person,

Mats Johnsson, Tekn Lic, PhD
assoc. professor vid avdelningen för Förpackningslogistik
(adjunct prof vid School of Packaging, Michigan State University)
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intygar härmed på heder och samvete att jag har studerat akterna för den danska patentansökan nr. PA 2002 00347 (tillhörande Inter IKEA Systems B.V.), och de av det danska patentverket framtagna patentskrifterna US 5615796 och US 5314738. Jag finner att den i patentansökan (speciellt krav 1, 7 och 8 av den 7 mars 2002) beskrivna uppfinningen rörande ett förpackningsmaterial av wellpapptyp väsentligt skiljer sig från vad som är visat i ovan nämnda patentskrifter.

Rörande det nya förpackningsmaterialet finner jag det speciellt viktigt att framhävda den tydliga fördel som kan uppnås genom att utnyttja det nya materialets speciella egenskaper och därvid minska material- och energiåtgång i olika förpackningsapplikationer.

Om nödvändigt, är jag redo att bekräfta ovanstående muntligt för berörda myndigheter.

Lund 28/4 2003

Mats Johnsson

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